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Joireman, J.A.; Kuhlman, D.M.; van Lange, P.A.M.; Doi, T.; Shelley, G.P.

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Perceived rationality, morality, and power of social choice as a function of interdependence structure and social value orientation

JEFFREY A. JOIREMAN,[1]*
D. MICHAEL KUHLMAN,[2]
PAUL A. M. VAN LANGE,[3] TOSHIAKI DOI[4]
AND GREGORY P. SHELLEY[2]
[1]*Washington State University, USA*
[2]*University of Delaware, USA*
[3]*Free University, Amsterdam, The Netherlands*
[4]*Science University of Tokyo, Oshamanbe Campus, Hokkaido, Japan*

Abstract

The present study examines how individuals with different social value orientations (i.e. prosocial, individualistic, and competitive) construe the rationality, morality, and power of choices in four distinct interdependence structures which systematically differ in the motives that could underlie the most prosocial or least aggressive choice: (a) altruism only, (b) altruism and cooperation, (c) altruism, cooperation, and individualism, and (d) altruism, cooperation, individualism, and competition. Results revealed that rationality ratings, and to a lesser degree morality and power ratings, increased most when the motives that could underlie a choice were part of the perceiver's social value orientation. Overall, the pattern of rationality ratings provided reasonable support for the Goal Prescribes Rationality Principle. Ratings of morality and power suggested a corresponding Goal Prescribes Morality/Power Principle (for prosocials and individualists), but revealed only mixed support for the Might Over Morality Hypothesis. Copyright © 2003 John Wiley & Sons, Ltd.

The ways in which conflicts of interests are solved and fruitful cooperation is established and maintained is importantly determined by whether individuals seek to enhance joint outcomes along with equality (Van Lange, 1999) in outcomes (*prosocial orientation*), their personal outcomes (*individualistic orientation*), or their relative advantage over others (*competitive orientation*). These three types of social value orientation (McClintock, 1978; Messick & McClintock, 1968) are predictive of cooperative and competitive behavior in experimental games and social dilemmas (e.g. Kramer, McClintock, & Messick, 1986; Kuhlman & Marshello, 1975; Liebrand, Wilke, Vogel, & Wolters, 1986b; Parks, 1994), willingness to sacrifice in close relationships (Van Lange, Agnew, Harinck, & Steemers, 1997), helping behavior (McClintock & Allison, 1989), negotiation (De Dreu, &

*Correspondence to: Jeffrey A. Joireman, Department of Psychology, Washington State University, Pullman, WA 99164-4820, USA. E-mail: joireman@mail.wsu.edu

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Van Lange, 1995), and real-life social dilemmas (Joireman, Van Lange, Kuhlman, Van Vugt, & Shelley, 1997; Van Vugt, Meertens, & Van Lange, 1995).

During the past two decades some lines of research have started to devote attention to the ways in which prosocials, individualists, and competitors *construe* behavior in settings of interdependence (e.g. Beggan, Messick, & Allison, 1988; Liebrand, Jansen, Rijken, & Suhre, 1986a; Kuhlman, Brown, & Teta, 1992; McClintock & Liebrand, 1988; Sattler & Kerr, 1991; Van Lange & Kuhlman, 1994). Consistent with some basic principles of interdependence theory (Kelley & Thibaut, 1978), these lines of research focusing on construal have provided good evidence that prosocials, individualists, and competitors differ in the meaning they attach to cooperative versus noncooperative behavior. This research suggests the importance of three dimensions of construal—morality, rationality, and power—which are similar to the classic dimensions of evaluation (morality) and potency (power) identified by Osgood, Suci, and Tannenbaum (1957), and the dimensions of social desirability (morality) and intellectual desirability (rationality) identified in the literature on person perception and implicit personality theories (e.g. Rosenberg & Sedlak, 1972; Schneider, 1973).

The purpose of the present study is to understand how individuals with prosocial, individualistic, and competitive orientations construe the rationality, morality, and power of the most benevolent (or least aggressive) choice across four distinct interdependence structures: (a) *convergence* (contrasting altruism with cooperation, individualism, competition, and aggression), (b) *prisoner's dilemma* (contrasting altruism and cooperation with individualism, competition, and aggression), (c) *maximizing difference* (contrasting altruism, cooperation, and individualism with competition and aggression), and (d) *malice* (contrasting altruism, cooperation, individualism, and competition, with aggression). We have chosen to focus on these particular structures for two reasons. First, these structures, while not comprehensive, arguably reflect a number of important decisions individuals face in everyday life. Second, as detailed below, these structures can be arranged along a theoretically meaningful continuum that systematically varies in terms of the personal and social well-being afforded by the choice alternatives. This ordering of structures subsequently allows for an examination of how people's views regarding morality, rationality, and power are influenced by three types of gain—joint, own, and relative gain—underlying the three most common social value orientations—prosocial, individualistic, and competitive orientations, respectively.

SOCIAL VALUE ORIENTATION: CONSTRUAL OF INTERDEPENDENT CHOICE

Construal: From Given to Effective Matrix

By definition, interdependent individuals are faced with options that impact both their own and another's well-being. The pattern of outcomes resulting from those options (i.e. the *interdependence structure*) can vary from situation to situation, as can the individuals faced with a given structure. As a result, each individual's evaluation (or 'construal') of the available options within a given interdependence structure is likely to be influenced by features of both the situation (i.e. what each option objectively affords) and the person (e.g. the individuals' values, beliefs, motives).

To differentiate between the 'objective' situation and an individual's 'subjective' construal of that situation, interdependence theory (Kelley & Thibaut, 1978) posits two conceptually distinct interdependence structures. The *given matrix* represents individual outcomes determined by the situation in combination with each individual's needs, skills, etc. The *effective (or transformed) matrix*, by contrast, represents the incorporation of broader considerations, considerations based in part on an individual's social value orientation (Messick & McClintock, 1968). Past research suggests that social

value orientation may impact the transformation from given to effective matrix (i.e. the construal of interdependent choice) in at least two ways.

Goal Prescribes Rationality Principle

According to the *Goal Prescribes Rationality Principle* (Van Lange, Liebrand, & Kuhlman, 1990), social value orientation shapes an individual's view regarding the most rational course of action in interdependent settings: prosocials are assumed to view cooperation (i.e. the pursuit of joint gain) as rational, whereas proselfs (individualists and competitors) are assumed to view noncooperation (i.e., the pursuit of individual or relative gain) as rational (cf. Kahan, 1974). Several lines of research support this idea. For example, the higher level of cooperation evidenced by prosocials in the prisoner's dilemma indirectly suggests that individuals with different social value orientations hold differing definitions of rationality (e.g. Kelley & Stahelski, 1970; Kuhlman & Marshello, 1975; McClintock & Liebrand, 1988). Additional evidence consistent with this idea demonstrates that individuals predisposed to cooperate (defect) in the prisoner's dilemma judge another person as more (less) intelligent when that person has made a cooperative choice (Van Lange & Kuhlman, 1994; Van Lange et al., 1990), and that prosocials expect more cooperation from a person who is described as intelligent, whereas individualists and competitors expect more cooperation from a person described as unintelligent (Van Lange & Liebrand, 1991a).

Might Over Morality Hypothesis

According to the *Might Over Morality Hypothesis* (Liebrand et al., 1986a), social value orientation influences the relative importance individuals attach to the dimensions of morality and power: prosocials are assumed to frame decision making in terms of morality, whereas individualists (and competitors) are assumed to frame decision making in terms of power. Globally speaking, cooperation is viewed as more moral than noncooperation, and noncooperation is viewed as more powerful than cooperation (Liebrand, et al., 1986a). However, several studies suggest that individuals differ in the relative importance they attach to these two dimensions. For example, Liebrand et al. (1986a) have demonstrated that, relative to individualists, prosocials differentiate between 'cooperative' actions (i.e. altruism and cooperation) and 'competitive' actions (i.e. individualism and competition) more in terms of morality, whereas, relative to prosocials, individualists differentiate between such actions more in terms of power. Subsequent research, which has tended to assume that competitors also emphasize the power dimension, has provided mixed support for the Might Over Morality Hypothesis; some studies support both predictions (e.g. Kuhlman et al., 1992; Van Lange & Kuhlman, 1994), others support only the morality prediction (e.g. Beggan et al., 1988; Sattler & Kerr, 1991; Van Lange et al., 1990), and others support only the might prediction (e.g. McClintock & Liebrand, 1988).

Summary

In sum, work to date suggests that social value orientations are linked with differing construals as to the most rational, moral, and powerful course of action in interdependent settings. Nevertheless, evidence for such differences is largely indirect, being inferred on the basis of choice behavior, expectations of others' choices, or evaluations of others who have made certain choices, and most past work has dealt exclusively with the prisoner's dilemma (for exceptions see Beggan et al., 1988; McClintock & Liebrand, 1988).

The present study addresses construal of interdependent choice by examining participants' judgments of the rationality, morality, and power of choice alternatives using a series of four conceptually distinct interdependence structures. The series of structures draws upon the same two dimensions which define social value orientation (i.e. concern with self and others), and thus provides a theoretically-based ordering of structures, including the prisoner's dilemma, which serves as the basis for our hypotheses. As we explain in more detail below, tests of the *Goal Prescribes Rationality Principle* are based on changes in rationality ratings *between* the four structures. Corresponding Goal Prescribes Morality and Power Principles are also predicted, and tested in the same way. By contrast, tests of the *Might Over Morality Hypothesis* are based on ratings of the morality and power of social choices *within* the structures. Below we explain the four structures, and develop our predictions for the Goal Prescribes Rationality (Morality, Power) Principle(s), and the Might Over Morality Hypothesis.

FOUR INTERDEPENDENCE STRUCTURES BASED ON CONCERN WITH SELF AND CONCERN WITH OTHERS

The Four Structures

Interdependent relationships can vary dramatically in terms of how their outcomes are structured. At times, one must choose between altruistic and nonaltruistic courses of action (e.g., a manager must decide between a policy benefiting one individual and a policy benefiting the entire organization). At other times, one must decide between cooperative and noncooperative courses of action (e.g. a committee member must choose between being well-prepared for a meeting and devoting time to competing demands). In other situations, one must choose between competitive and noncompetitive courses of action (e.g. a business person may devote time and energy, that would otherwise benefit their own business, to hindering a competitor's business). Finally, individuals may at times be faced with a choice between aggressive and nonaggressive courses of action (e.g. a soccer player may receive a penalty, leading to the player's team's eventual loss, by committing an obvious aggressive foul). While by no means comprehensive, these four scenarios would seem to capture some interesting and presumably commonplace decisions people face in everyday life.

An example of each structure is presented in the left part of Table 1. The row player's outcomes appear to the left of each comma, while the column player's outcomes appear to the right of the comma, with higher numbers representing more attractive outcomes (actual outcomes are described in the Method section). The first three structures correspond to experimental games which have traditionally been labeled convergence, prisoner's dilemma, and maximizing difference/spite, while the latter, which might be labeled malice, corresponds to Rapoport and Guyer's (1966) No-Conflict Game 3 (cf. Hamburger, 1979; McClintock & McNeel, 1967).

Dominating Strategies within the Four Structures

As indicated in the right half of Table 1, the rows within each structure maximize certain social goals, goals which are theoretically linked to the various social value orientations under consideration in the present study. Applying Kelley and Thibaut's (1978) nomenclature, these social goals include maximizing the other's gain (*MaxOther*, or *altruism*); maximizing joint gain (*MaxJoint*, or

Table 1. Four interdependence structures based on concern with self and concern with others

Interdependence structure[a]			Social goals maximized by row
Convergence			
	X	Y	
A	2, 2	1, 4	MaxOther
B	4, 1	3, 3	MaxJoint, MaxOwn, MaxRelative, MinOther
Prisoner's Dilemma			
	X	Y	
A	3, 3	1, 4	MaxOther, MaxJoint
B	4, 1	2, 2	MaxOwn, MaxRelative, MinOther
Maximizing Difference			
	X	Y	
A	4, 4	2, 3	MaxOther, MaxJoint, MaxOwn
B	3, 2	1, 1	MaxRelative, MinOther
Malice			
	X	Y	
A	4, 4	3, 2	MaxOther, MaxJoint, MaxOwn, MaxRelative
B	2, 3	1, 1	MinOther

[a]Row Player's outcomes appear to the left of the comma in each cell. Actual outcomes are described in the Method section.

cooperation); maximizing one's own gain (*MaxOwn*, or *individualism*); maximizing one's relative advantage over others (*MaxRelative*, or *competition*); and minimizing the other's gain (*MinOther*, or *aggression*).

An inspection of the outcomes in the four structures reveals that each structure provides a *dominating strategy* for each social value orientation under consideration in the present study. That is, each structure contains an alternative which *unconditionally maximizes* certain social goals, regardless of the choice one's partner makes. For example, in convergence, the top row 'dominates' the bottom row for the altruist, as it always maximizes the other's gain: if the column playing partner chooses X, the row playing altruist should choose A, as $2 > 1$, and if the column playing partner chooses Y, the row playing altruist should still choose A, as $4 > 3$. By contrast, in convergence, the bottom row would dominate the top row for prosocials, individualists, competitors, and aggressors, as the bottom row always maximizes joint, own, and relative gain, and always minimizes the other's gain.

Theoretically Based Changes Between Structures

As indicated in the right half of Table 1, each change in structure corresponds to an additional incentive to choose the top row. These changes exist along a theoretically meaningful continuum that systematically varies in terms of the personal and social well-being afforded by the choice alternatives. For example, a change from convergence to prisoner's dilemma corresponds to the inclusion of joint gain in the top row, while a change from prisoner's dilemma to maximizing difference corresponds to the inclusion of own gain in the top row. Hence, an increase in the rationality ratings of the top row between convergence and prisoner's dilemma provides evidence that joint gain is seen as rational. Similarly, an increase in rationality ratings between prisoner's dilemma and maximizing difference provides evidence that own gain is seen as rational. As outlined in more detail below, we used these game to game changes to test the Goal Prescribes Rationality Hypothesis, as well as the corresponding Goal Prescribes Morality, and Power Hypotheses.

PREDICTED CHANGES IN RATIONALITY RATINGS BETWEEN STRUCTURES: THE GOAL PRESCRIBES RATIONALITY PRINCIPLE

Examining the progression of the structures, it seems reasonable to expect that the judged rationality of the top row should increase systematically from convergence through malice (*Hypothesis 1a*), as additional incentives to choose the top row are added. More important, following the Goal Prescribes Rationality Principle (Van Lange et al., 1990), social value orientation should interact with the interdependence structure such that the largest increases in rationality ratings will occur when the social goal corresponding to an individual's social value orientation is added to the top row (*Hypothesis 1b*). For example, prosocials should show a significant increase in rationality ratings when moving from convergence to prisoner's dilemma, individualists when moving from prisoner's dilemma to maximizing difference, and competitors when moving from maximizing difference to malice, as these changes correspond to the inclusion of joint gain, own gain, and relative gain, respectively, in the top row.

Hypothesis 1b can be stated in two forms. The *strong version* of Hypothesis 1b predicts that the only type of social goal people will view as rational is the social goal corresponding to their own social value orientation (e.g., prosocials should view only joint gain as rational). The *weak version* of Hypothesis 1b predicts that views regarding the rationality of any given social goal will be based on its proximity to an individual's own social value orientation within the classic two-dimensional geometric model of social value orientation (Griesinger & Livingston, 1973). According to this model, the prosocial orientation corresponds to a vector with an angle of 45°, while individualistic and competitive orientations correspond to vectors of 0° and −45°, respectively. Thus, an individualistic orientation is closer to a prosocial orientation than is a competitive orientation.

The weak (and in our judgment, more realistic) form of Hypothesis 1b predicts an ordering of the impact of each type of social gain within each social value orientation group. For example, within prosocials, rationality ratings should be most affected by joint gain, then own gain, then relative gain. For competitors, the order is reversed: rationality ratings should be most affected by relative gain, followed by own gain, followed by joint gain. For individualists, own gain should exert the largest impact. Beyond own gain, the ordering of the impact for joint gain and relative gain within individualists is difficult to predict, given that both types of gain are (theoretically) equidistant from individualism.

PREDICTED CHANGES IN MORALITY RATINGS BETWEEN STRUCTURES: THE GOAL PRESCRIBES MORALITY PRINCIPLE

We assume that the perceived morality of an interdependent choice alternative will be guided by the amount of benefit it provides to others and the self. We further assume that actions which directly harm others will not be seen as moral. Moving from convergence to maximizing difference, the top row does not produce direct harm, and the number of beneficiaries (other, collective, and self) systematically increases. In malice, however, the top row also maximizes relative gain, which by definition encompasses a negative concern for the outcomes of others. Thus, it seems reasonable to assume that morality ratings will show a monotonic increasing function over the first three structures which shows no further increase in the fourth structure (*Hypothesis 2a*).

Beyond this general prediction, in the current paper, we test the hypothesis that a principle similar to the Goal Prescribes Rationality Principle might guide prosocials', individualists', and competitors' views regarding the morality of joint, own, and relative gain. Two lines of previous research lead to this prediction. First, it has long been known that people evidence a false consensus bias (Ross, Greene,

& House, 1977), assuming that other people hold values, beliefs, and attitudes similar to their own. Second, early work on social value orientation demonstrated that individuals tend to assume that others will pursue social value orientations similar to their own (i.e. structured assumed similarity bias; Kuhlman & Wimberley, 1976). On the basis of these findings, people might be expected to evidence a *Goal Prescribes Morality Principle*, such that the rated morality of an action is based on its proximity to an individual's own social value orientation (*Hypothesis 2b*). According to this hypothesis, prosocials should judge joint gain as the most moral, followed by own gain, followed by relative gain; individualists should view own gain as most moral, followed by joint gain and relative gain; and competitors should view relative gain as most moral, followed by own gain, followed by joint gain.

PREDICTED CHANGES IN POWER RATINGS BETWEEN STRUCTURES: THE GOAL PRESCRIBES POWER PRINCIPLE

With regard to power, we would predict a monotonic increasing function over the set of four structures, one that allows for the possibility of an increase in judged power in the fourth structure, as competition is a form of power (*Hypothesis 3a*). Based on the same reasoning outlined above for the Goal Prescribes Morality Principle, we expect that people will judge the power of each type of social gain (joint, own, and relative) based on its proximity to their own social value orientation (*Hypothesis 3b*). For example, prosocials should judge joint gain as the most powerful, followed by own gain, followed by relative gain; individualists should view own gain as most powerful, followed by joint gain and relative gain; and competitors should view relative gain as most powerful, followed by own gain, followed by joint gain.

RELATIVE IMPORTANCE OF MORALITY AND POWER: THE MIGHT OVER MORALITY HYPOTHESIS

In addition to testing the parallel Goal Prescribes Rationality/Morality/Power Hypotheses, we used the morality and power ratings across the four structures to test predictions based on the Might Over Morality Hypothesis (Liebrand et al., 1986a). In its most general form, the Might Over Morality Hypothesis concerns the relative importance individuals with different social value orientations place on 'morality' and 'power' when differentiating between socially interdependent acts that differ in terms of the benefit/harm they produce for self and other. More specifically, according to this hypothesis, relative to individualists and competitors, prosocials should discriminate between socially interdependent acts more in terms of morality. By contrast, relative to prosocials, individualists and competitors should discriminate between such acts more in terms of power.

As noted above, the Might Over Morality Hypothesis has inspired considerable research and the bulk of the findings are supportive. Also as noted above, most of these findings are based on judgments made of the morality and power of the 'cooperative' and 'competitive' choices in the prisoner's dilemma game. This raises an important question regarding the generalizability and interpretation of the Might Over Morality effect itself, since both the 'cooperative' and the 'competitive' choices in a prisoner's dilemma may be driven by a number of different motives. As shown in Table 1, the 'cooperative' choice in a prisoner's dilemma may reflect either an altruistic choice (maximizing the other's gain) or a cooperative choice (maximizing joint gain). Similarly, the 'competitive' choice in the prisoner's dilemma may reflect an individualistic choice (maximizing own gain), a competitive choice (maximizing relative gain), or an aggressive choice (minimizing other's gain). Given this confounding of motives, it becomes important to ask two questions. First, does the Might Over

Morality effect generalize to interdependence structures beyond the prisoner's dilemma? Second, precisely which aspect of a cooperative choice (other's gain or joint gain) is viewed as more moral than the competitive choice? Similarly, precisely which aspect of a competitive choice (own gain, relative gain, or other's loss) is regarded as more powerful than the cooperative choice? Below we outline how varying patterns of morality and power ratings across the four structures can help address these questions. We begin by considering the morality component of the Might Over Morality Hypothesis, and then turn to the power component.

Regarding the question of generalizability, if the morality component of the Might Over Morality effect generalizes over interdependence structures, we would expect prosocials' morality judgments to be more extreme than those of proselfs (individualists and competitors) in all four structures. Regarding the interpretation of the morality component, two possibilities exist. If the morality component of Might Over Morality effect is based on altruism, we would expect to see the top row judged most moral in all four structures. On the other hand, if the morality component of the Might Over Morality effect is based on joint gain, we would expect to see the bottom row judged most moral in convergence, and the top row judged as most moral in the remaining three structures.

Similar reasoning can be used to evaluate the generalizability and interpretation of the power component of the Might Over Morality effect. If the power component of the Might Over Morality effect is general over structure then the power ratings of proselfs should be more extreme than those of prosocials in all four structures. Depending on the type of social gain involved with this component, the row judged most powerful will change over the four structures as follows:

(1) If aggression is the basis for the effect, the bottom row should be judged to be the most powerful in all four structures.
(2) If competition is the basis for the effect, the bottom row should be judged to be the most powerful in the first three structures, and the top row should be rated most powerful in the last structure (i.e. malice).
(3) If individualism is the basis for the effect, the bottom row should be judged most powerful in convergence and prisoner's dilemma, and the top row should be judged most powerful in maximizing difference and malice.

METHOD

Participants

Participants consisted of 171 undergraduates (65 men, 105 women, 1 sex unidentified) who participated in partial fulfillment of a course requirement in Introductory Psychology. Participants were run in groups varying in size from 8 to 27.

Procedure

Measurement of Social Value Orientation

Participants' social value orientation was assessed using a set of 24, 2-choice decomposed games (Messick & McClintock, 1968) offering points to Self and Other. For example, in one game, participants chose between Option A (100 for Self, 80 for Other) and Option B (120 for Self and 50 for Other). In this game, Option A satisfies the motives of altruism (highest payoff to other) and cooperation (highest joint payoff) while option B satisfies the motives of individualism (highest own

payoff) and competition (highest relative gain). To be classified, 60% of a participant's choices had to maximize one of the three social value orientations under investigation. Accordingly, 151 (88%) of the participants were classifiable, including 40 prosocials (16 men, 24 women), 70 individualists (29 men, 41 women) and 41 competitors (15 men, 26 women).[1]

Rating Task

In addition to the decomposed games measure, participants rated the morality, rationality, and power of the choice alternatives in a set of 12, 2×2 matrix games (4 structures $\times$ 3 games in each structure). Each of the 12 matrix games is a 'recomposition' of a two-alternative decomposed game. The two alternatives in each decomposed game correspond to points on the right half of the two-dimensional social value orientation circle (cf. Liebrand & McClintock, 1988) with a radius of 100, an origin of zero. The angular separation of alternatives in each decomposed game was 15°. Thus, the three decomposed games that generate the 2×2 convergence matrix games span an arc of 45°, beginning at 90° and ending at 45°. For prisoner's dilemma, maximizing difference, and malice, the three decomposed games spanned arcs from 45° through 0°, 0° through −45°, and−45° through −90°, respectively.

To introduce the rating task, we informed participants that they would be asked to 'make comparisons between two options on a number of separate dimensions'. An unrelated example was used to introduce the use of the 5-point rating scale described below. Once the general form of the scale had been explained, participants received instructions indicating that they would be asked to compare alternatives A and B (from the row player's perspective) on a number of different dimensions. It is relevant to note that participants were not instructed to evaluate people who made such choices, but rather, the choices themselves. In addition, to provide maximal latitude for construal, participants were not told how to interpret the terms morality, rationality, and power. The experimenter then stated the dimension to be used for comparison, and instructed participants in the use of the scale for the specific dimension, stating:

> For each of the 12 problems, we would like you to complete the following sentence: Option A is . . . (a) much less moral [powerful, rational], (b) a little less moral, (c) equally moral, (d) a little more moral or (e) much more moral . . . compared to option B.

Following this general introduction, the 12 games were presented via an overhead in a single random order, and were rated by all participants on morality, power, and rationality, in that order. Participants received 15 seconds to make each judgment. Following the rating task, participants were debriefed and thanked for their participation.[2]

RESULTS

Check on Gender Effects

Five cases were dropped due to missing data on one or more of the 12 ratings, leaving a total sample size of 146, consisting of 40 prosocials, 67 individualists, and 39 competitors. As initial analyses

[1]Prosocials may also be motivated by a desire to minimize the difference in self-other payoffs (Van Lange, 1999). In the present study, we focused on prosocials who maximize joint gain, as the number of prosocials pursuing equality was quite small ($N = 9$).
[2]We did not assess choice behavior because choices may influence ratings in several ways (e.g. through justification and self-perception processes). Granted, it is plausible that even in the absence of the actual choices, the ratings might be influenced by a process of making 'hypothetical choices' (i.e. choice that participants might imagine making). However, we did not want to enhance the salience of actual choices by asking participants to make choices across these games.

revealed no main or interactive effects for the subject's gender, gender was not included in our analyses.

Data Transformation and Design of Analyses

Prior to the analyses, ratings were transformed by subtracting 3, in order to reflect the rating's deviation from the scale midpoint of 3 (i.e. the alternatives are equally rational, moral, powerful). As outlined in more detail below, to evaluate the Goal Prescribes Rationality/Morality/Power hypotheses, a common strategy was used for each rating, in which tests of the global effects were followed up by more specific comparisons allowing for direct tests of our hypotheses. The strategy for testing the Might Over Morality hypotheses will be described following the presentation of results for the Goal Prescribes Rationality, Morality and Power predictions.

Common Strategy: Global Effects

Dropping gender and averaging over the three games within each structure, the final *global design* for each rating consisted of a 3 (Social Value Orientation: prosocial, individualist, competitor) $\times$ 4 (Structure: convergence, prisoner's dilemma, maximizing difference, malice) mixed-design with social value orientation serving as the between-participants variable and structure serving as the within-participants variable. These tests were based on the multivariate model for repeated measures designs. As described below, all global effects were significant for each effect. Tests using the Greenhouse-Geisser or Huynh-Feldt adjusted degrees of freedom approach to 'mixed model' repeated measures designs led to identical conclusions.

Common Strategy: Focused Comparisons

In conjunction with the global 3×4 analyses, we conducted several more focused comparisons which allowed us to more directly examine the impact of joint gain, own gain, and relative gain on participants' ratings of rationality, morality and power. The impact of each type of gain corresponds to a change in ratings between the four adjacent structures (convergence, prisoner's dilemma, maximizing difference, and malice). Panel A of Figures 1–3 show each social value orientation group's rationality, morality, and power ratings, respectively. For each rating, three impact scores were calculated which serve as the basis for specific tests of our Goal Prescribes Rationality/Morality/Power Hypotheses. The *impact of joint gain* was calculated by subtracting the rating in convergence from the rating in prisoner's dilemma. The *impact of own gain* was calculated by subtracting the rating in prisoner's dilemma from the rating in maximizing difference. And the *impact of relative gain* was computed by subtracting the rating in maximizing difference from the rating in malice. These impact scores for each social value orientation group are shown in Panel B of Figures 1–3.

For each rating, the three impact scores were used to address three issues. First, do the impact scores differ between social value orientation groups? For example, is the impact of joint gain on rationality ratings larger in prosocials than in proselfs? This would involve a comparison of the black bar (prosocials) with the white and gray bars combined for the impact of joint gain shown in Panel B of Figure 1. These are referred to as tests of *between-orientation differences in impact*. Second, do the impact scores differ from one another within each social value orientation group? For example, within prosocials, does the impact of joint gain on rationality judgments differ from the impact of own gain? This would involve a comparison of the black bars (prosocials) for the impact of joint gain with the impact of own gain shown in Panel B of Figure 1. These are referred to as tests of *relative impact*.

Third, do the impact scores differ from zero within each social value orientation group? For example, among prosocials, does joint gain affect rationality ratings in an absolute sense? This would involve a test of the deviation from zero of the black bar (prosocials) for the impact of joint gain shown in Panel B of Figure 1. These are referred to as tests of *absolute impact*.

Rationality Ratings

Global Analysis

A mixed-model analysis of variance on the rationality ratings revealed significant main effects for structure, $F(3, 141) = 63.59$, $p < 0.001$, and social value orientation, $F(2, 143) = 9.21$, $p < 0.001$. Consistent with Hypothesis 1a, rationality ratings increased across the structures with the inclusion of joint, own, and relative gain (see bottom of Table 2). Subsequent analyses of the pairwise differences between structures revealed reliable effects for joint gain, $F(1, 143) = 50.14$, $p < 0.001$, own gain, $F(1, 143) = 55.06$, $p < 0.001$, and relative gain, $F(1, 143) = 10.77$, $p < 0.01$. Thus, at the global level, the maximization of each type of social goal appears to be regarded as rational.

While noteworthy, our primary interest was to determine whether such changes in perceived rationality corresponded to the participant's social value orientation in a manner consistent with the Goal Prescribes Rationality Principle (i.e. Hypothesis 1b). Consistent with Hypothesis 1b, the structure effect was moderated by social value orientation, $F(6, 282) = 4.35$, $p < 0.001$. The means associated with this interaction are displayed in Figure 1 (Panel A). As can be seen, the rationality ratings tended to rise most notably when an individual's social goal was added to the top row.

Between-orientation Differences in the Impact of Joint, Own, and Relative Gain

As noted earlier, to more precisely test the Goal Prescribes Rationality/Morality/Power Hypotheses, we followed up each global analysis using a set of three more focused comparisons. In this section, we focus on whether the impact of joint, own, and relative gain on rationality ratings differs between

Table 2. Mean rationality ratings as a function of social value orientation and interdependence structure

Social value orientation	Interdependence structure					Impact of type of gain within each SVO[a]		
	CV	PD	MD	ML	Mean	Joint	Own	Relative
Prosocials								
M	−1.10	0.50	1.24	1.28	0.48	1.60**	0.74**	0.04
SD	0.82	1.22	1.00	0.96				
Individualists								
M	−0.76	−0.15	0.80	1.01	0.23	0.61**	0.95**	0.21
SD	0.95	1.03	1.06	1.01				
Competitors								
M	−0.76	−0.53	0.31	0.97	0.00	0.23	0.84**	0.66**
SD	0.92	1.10	1.12	0.88				
Mean	−0.87	−0.06	0.78	1.09	0.23	0.81**	0.84**	0.30**

Note: Ratings are deviated from the scale midpoint of 3. Positive values indicate that the choice alternative in the top row was rated as more rational than the bottom row alternative. CV = Convergence, PD = Prisoner's Dilemma, MD = Maximizing Difference, ML = Malice.

[a]Joint = (Prisoner's Dilemma—Convergence), Own = (Maximizing Difference—Prisoner's Dilemma), Relative = (Malice—Maximizing Difference). Means differing from zero are denoted by asterisks: * $p < 0.05$; ** $p < 0.001$.

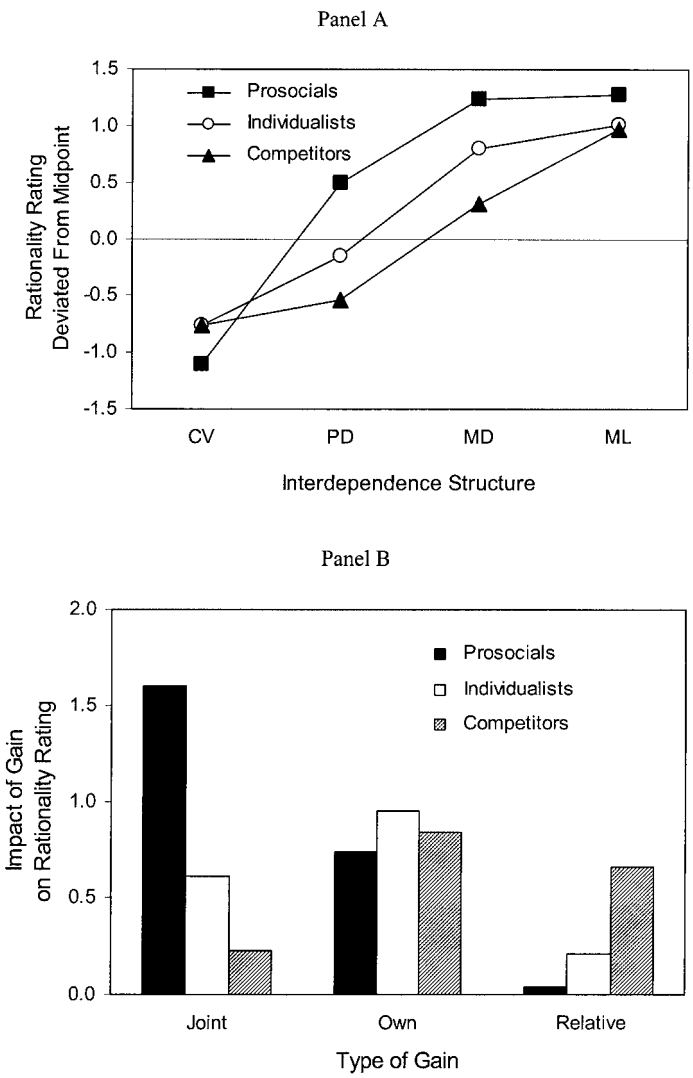

Figure 1. Rationality ratings as a function of interdependence structure and social value orientation (Panel A), and impact of joint, own, and relative gain on rationality ratings within each social value orientation (Panel B)

social value orientation groups. As an initial step, we first submitted the three impact scores for rationality to a 3 (Social Value Orientation: prosocial, individualist, competitor) $\times$ 3 (Type of Gain: joint, own, relative) mixed-model analysis of variance. As anticipated, the analysis yielded a significant interaction between social value orientation and type of gain, $F(4, 284) = 6.27$, $p < 0.001$, indicating that the importance of the three types of gain varied as a function of social value orientation (see Figure 1, Panel B). Next, we used two planned comparisons to examine differences in the impact of joint, own, and relative gain between the different social value orientation groups. The first contrast compared prosocials with proselfs (individualists and competitors combined); the second compared individualists with competitors.

On *impact of joint gain*, prosocials differed significantly from proselfs, $F(1, 143) = 21.96$, $p < 0.001$. As can be seen in Figure 1 (Panel B), relative to proselfs, prosocials' rationality judgments

were affected more by joint gain. The impact of joint gain on rationality ratings did not differ between individualists and competitors, $F(1, 143) = 1.93$, $p = 0.17$. These results support Hypothesis 1b for the impact of joint gain. On the *impact of own gain*, none of the contrasts were significant (all p's > 0.50). Thus, contrary to Hypothesis 1b, it appears that own gain is judged to be equally rational by prosocials, individualists, and competitors alike. Finally, the *impact of relative gain* was greater in proselfs than in prosocials, $F(1, 143) = 3.98$, $p < 0.05$. The impact of relative gain was also greater in competitors than in individualists, $F(1, 143) = 4.19$, $p < 0.05$. Thus, these results support Hypothesis 1b for the impact of relative gain.

Relative Impact of Joint, Own, and Relative Gain within Social Value Orientation

Next, we evaluated the *relative impact* of each type of gain within each social value orientation group. These tests produced results partly consistent with the Goal Prescribes Rationality principle (Hypothesis 1b). *Within prosocials*, the impact of joint gain on rationality ratings was significantly higher than both the impact of own gain, $F(1, 143) = 6.95$, $p < 0.001$, and the impact of relative gain, $F(1, 143) = 29.25$, $p < 0.001$; within prosocials, the impact of own gain was also significantly higher than the impact of relative gain, $F(1, 143) = 5.18$, $p < 0.05$. *Within individualists*, the impact of own gain was not significantly higher than the impact of joint gain, $F(1, 143) = 1.86$, *ns*, but the impact of own gain was significantly higher than the impact of relative gain, $F(1, 143) = 9.38$, $p < 0.01$; within individualists, the impact of joint gain was also marginally higher than the impact of relative gain, $F(1, 143) = 3.08$, $p < 0.10$. *Within competitors*, the impact of relative gain was not significantly higher than the impact of either joint gain, $F(1,143) = 2.12$, $p = 0.15$, or own gain, $F(1, 143) < 1$, *ns*; however, within competitors, the impact of own gain was marginally higher than the impact of joint gain, $F(1, 143) = 3.39$, $p < 0.10$.

Absolute Impact of Joint, Own, and Relative Gain within Social Value Orientation

As a final step in our analysis, we examined the *absolute impact* of each type of gain on the rationality ratings of each social value orientation by evaluating whether the three structure-to-structure changes differed significantly from zero within prosocials, individualists and competitors (see right half of Table 2, and bottom panel of Figure 1). Results revealed that prosocials considered both joint gain and own gain as rational, F's$(1, 143) = 56.64$ and 12.41, p's < 0.001, but did not view relative gain as rational, $F(1, 143) < 1$, *ns*. Individualists also viewed both join gain and own gain as rational, F's$(1, 143) = 13.65$ and 34.13, p's < 0.001, but they did not view relative gain as rational, $F(1, 143) = 2.64$, *ns*. Finally, competitors did not view joint gain as rational, $F(1, 143) = 1.15$, $p > 0.25$, but they did view own and relative gain as rational, F's$(1, 143) = 15.44$ and 14.55, p's < 0.001.

Summary

These findings provide some support for the Goal Prescribes Rationality Principle. In general, the largest increases in rationality ratings occurred when an individual's social goal was added to the top row. However, inconsistent with the Goal Prescribes Rationality Principle, all social value orientation groups viewed own gain as rational. While not in line with a 'strong' interpretation of the Goal Prescribes Rationality Principle, these results suggest that rationality ratings of joint, own, and relative gain are systematically linked to one's own social value orientation and its proximity to other social

value orientations in the two-dimensional social value orientation space (thus supporting a 'weak' version of the Goal Prescribes Rationality Hypothesis). As will be seen in the next section, a (somewhat) similar pattern of results emerges for the judgments of morality.

Morality Ratings

Global Analysis

A mixed-model analysis of variance on the morality ratings revealed significant main effects for structure, $F(3, 141) = 30.45$, $p < 0.001$, and social value orientation, $F(2, 143) = 5.75$, $p < 0.01$. Consistent with Hypothesis 2a, pairwise comparisons between the structures revealed that morality ratings increased significantly with the inclusion of both joint gain and own gain, F's$(1, 143) = 37.76$ and 41.04, p's < 0.001, but not relative gain $F(1, 143) < 1$, *ns* (see bottom of Table 3).

As before, we were primarily interested in whether changes in the perceived morality of the choice alternatives varied as a function of participants' social value orientation. In line with Hypothesis 2b, the structure effect was moderated by social value orientation, $F(6, 282) = 2.56$, $p < 0.05$. The means associated with this interaction are presented in Figure 2 (Panel A).

Between-orientation Differences in the Impact of Joint, Own, and Relative Gain

As before, we were interested in whether the impact of joint, own, and relative gain on morality ratings differed between the three social value orientation groups. An initial 3 (Social Value Orientation) × 3 (Type of Gain) mixed-model analysis of variance indicated that the relative importance of the three types of gain on morality ratings varied as a function of social value orientation (see Figure 2, Panel B), although the interaction between social value orientation and type of gain was only marginally significant, $F(4, 284) = 2.04$, $p < 0.10$. Planned comparisons contrasting the social value orientation

Table 3. Mean morality ratings as a function of social value orientation and interdependence structure

Social value orientation	Interdependence structure					Impact of type of gain within each SVO[a]		
	CV	PD	MD	ML	Mean	Joint	Own	Relative
Prosocials								
M	−0.83	0.32	1.04	1.08	0.40	1.15**	0.72**	0.04
SD	0.91	1.08	0.98	0.91				
Individualists								
M	−0.50	0.18	0.66	0.66	0.25	0.68**	0.48**	0.00
SD	0.98	0.87	0.91	1.08				
Competitors								
M	−0.34	−0.21	0.40	0.28	0.03	0.13	0.61**	−0.12
SD	0.88	1.02	0.76	0.84				
Mean	−0.56	0.10	0.70	0.67	0.23	0.66**	0.60**	−0.03

Note: Ratings are deviated from the scale midpoint of 3. Positive values indicate that the choice alternative in the top row was rated as more moral than the bottom row alternative. CV = Convergence, PD = Prisoner's Dilemma, MD = Maximizing Difference, ML = Malice.

[a]Joint = (Prisoner's Dilemma—Convergence), Own = (Maximizing Difference—Prisoner's Dilemma), Relative = (Malice—Maximizing Difference). Means differing from zero are denoted by asterisks: * $p < 0.05$; ** $p < 0.001$.

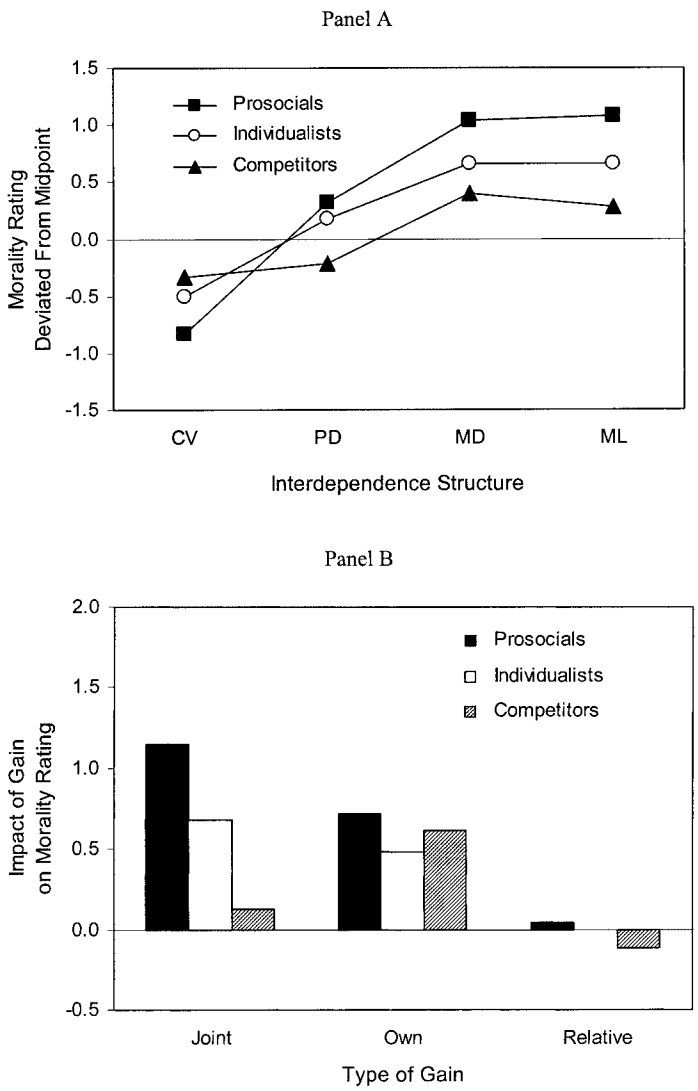

Figure 2. Morality ratings as a function of interdependence structure and social value orientation (Panel A), and impact of joint, own, and relative gain on morality ratings within each social value orientation (Panel B)

groups on each of the three types of gain revealed significant effects for only one type of gain, namely joint gain. The *impact of joint gain* (on morality ratings) was significantly higher in prosocials than in proselfs, $F(1, 143) = 9.98$, $p < 0.001$, and was significantly higher in individualists than in competitors, $F(1, 143) = 4.68$, $p < 0.05$. The p-values for the remaining comparisons involving the impact of own and relative gain ranged from 0.37 to 0.83. In sum, joint gain appears to influence morality judgments of prosocials more than proselfs. Similarly, joint gain has a larger impact on the morality judgments of individualists than competitors. Finally, the three social value orientation groups' morality judgments appear to be equally affected by own gain; and, relative gain does not appear to be seen as moral by any of the social value orientation groups. Thus, Hypothesis 2b (the Goal Prescribes Morality Hypothesis) is only partially supported by these findings.

Relative Impact of Joint, Own, and Relative Gain within Social Value Orientation

As before, we were also interested in evaluating the *relative impact* of each type of gain within each social value orientation. Results were partly consistent with the Goal Prescribes Morality Hypothesis. *Within prosocials*, the impact of joint gain (on morality ratings) was marginally higher than the impact of own gain, $F(1, 143) = 2.26$, $p < 0.15$, and was significantly higher than the impact of relative gain, $F(1, 143) = 23.13$, $p < 0.001$; within prosocials, own gain also produced a greater increase in morality ratings when compared to relative gain, $F(1, 143) = 10.25$, $p < 0.01$. *Within individualists*, the impact of own gain was not significantly larger than the impact of joint gain, $F(1, 143) < 1$, *ns*, but the impact of own gain was significantly higher than the impact of relative gain, $F(1, 143) = 8.19$, $p < 0.01$; within individualists, joint gain also resulted in a larger increase in morality ratings than did relative gain, $F(1, 143) = 14.44$, $p < 0.001$. *Within competitors*, the impact of own gain was significantly higher than the impact of relative gain, $F(1, 143) = 11.02$, $p < 0.001$, and marginally higher than the impact of joint gain, $F(1, 143) = 2.70$, $p < 0.11$; within competitors, the impact of joint gain and relative gain were not significantly different, $F(1, 143) = 1.19$, $p > 0.25$.

Absolute Impact of Joint, Own, and Relative Gain within Social Value Orientation.

As a final step in our analysis, we examined the *absolute impact* of each type of gain on the morality ratings of each social value orientation by evaluating whether the three structure-to-structure changes differed significantly from zero within prosocials, individualists, and competitors (see right half of Table 3, and bottom panel of Figure 2). Results revealed that prosocials viewed both joint gain and own gain as moral, F's$(1, 143) = 33.80$ and 17.27, p's < 0.001, but did not view relative gain as moral, $F(1, 143) < 1$, *ns*. Individualists also viewed joint and own gain as moral, F's$(1, 143) = 19.89$ and 12.56, p's < 0.001, but they did not view relative gain as moral, $F(1, 143) < 1$, *ns*. Competitors did not view joint or relative gain as moral, both F's $(1, 143) < 1$, *ns*, but they did view own gain as moral, $F(1, 143) = 11.80$, $p < 0.001$.

Summary

To summarize, there is no evidence that relative gain is judged moral by anyone, including competitors. This supports our earlier argument that behavior that intends harm to others is not seen as moral. Beyond that, it appears that each social value orientation' sense of interdependent morality relates to the proximity of joint gain and own gain to each group's own social value orientation. This is similar to the effects for rationality judgments reported earlier. For example, at the 'absolute' level, prosocials and individualists view joint gain as moral but competitors do not and all social value orientation groups judge own gain as moral. At the 'relative' level, both prosocials and individualists see competition as less moral than either joint or own gain, and competitors see own gain but not joint gain as more moral than competition. Thus, results for the Goal Prescribes Morality Principle tend to be best upheld within prosocials and individualists.

Power Ratings

Global Analysis

A mixed-model analysis of variance on the power ratings revealed significant main effects for social value orientation, $F(2, 143) = 11.13$, $p < 0.001$, and structure, $F(3, 141) = 83.96$, $p < 0.001$. In partial

Table 4. Mean power ratings as a function of social value orientation and interdependence structure

Social value orientation	Interdependence structure					Impact of type of gain within each SVO[a]		
	CV	PD	MD	ML	Mean	Joint	Own	Relative
Prosocials								
M	−1.02	0.43	1.27	1.16	0.46	1.45**	0.84**	−0.11
SD	0.73	1.08	0.77	0.95				
Individualists								
M	−0.90	−0.26	0.95	0.88	0.17	0.64**	1.21**	−0.07
SD	0.90	1.02	0.90	1.13				
Competitors								
M	−0.90	−0.44	0.31	0.69	−0.09	0.46*	0.75**	0.38*
SD	0.75	0.98	1.14	1.02				
Mean	−0.94	−0.09	0.84	0.91	0.18	0.85**	0.93**	0.07

Note: Ratings are deviated from the scale midpoint of 3. Positive values indicate that the choice alternative in the top row was rated as more powerful than the bottom row alternative. CV = Convergence, PD = Prisoner's Dilemma, MD = Maximizing Difference, ML = Malice.

[a]Joint = (Prisoner's Dilemma—Convergence), Own = (Maximizing Difference—Prisoner's Dilemma), Relative = (Malice—Maximizing Difference). Means differing from zero are denoted by asterisks: $*p < 0.05$; $**p < 0.001$.

support of Hypothesis 3a, analysis of variance on the pairwise differences between structures revealed a reliable effects for joint gain and own gain, F's$(1, 143) = 66.27$ and 107.09, p's < 0.001. However, inconsistent with Hypothesis 3a, relative gain was not judged to be powerful, $F(1, 143) < 1$, *ns* (see bottom of Table 4).

While interesting, we were primarily concerned with whether changes in the perceived power of the choice alternatives varied as a function of participants' social value orientation. In line with Hypothesis 3b, the structure effect was moderated by social value orientation, $F(6, 282) = 3.83$, $p < 0.001$. The means associated with this interaction are shown in Figure 3 (Panel A).

Between-orientation Differences in the Impact of Joint, Own, and Relative Gain

As before, we were interested in whether the impact of joint, own, and relative gain on power ratings differed between the three social value orientation groups. An initial 3 (Social Value Orientation) × 3 (Type of Gain) mixed-model analysis of variance revealed a significant interaction between social value orientation and type of gain, $F(4, 284) = 5.09$, $p = 0.001$, indicating that the relative importance of the three types of gain varied as a function of social value orientation (see Figure 3, Panel B). As with rationality and morality judgments, we performed two planned social value orientation contrasts on each impact score. On the *impact of joint gain*, prosocials scored higher than proselfs, $F(1, 143) = 15.64$, $p < 0.001$, but there was no difference in joint gain's impact between individualists and competitors ($F < 1$). On the *impact of own gain*, prosocials and proselfs did not differ significantly ($F < 1$), but own gain's impact was significantly higher in individualists than in competitors, $F(1, 143) = 4.83$, $p < 0.05$. On the *impact of relative gain*, prosocials and proselfs did not differ significantly, $F(1, 143) = 1.38$, *ns*, but competitors tended to score higher than individualists, $F(1, 143) = 3.48$, $p = 0.06$. Thus, these results provide partial support for Hypothesis 3b (the Goal Prescribes Power Hypothesis).

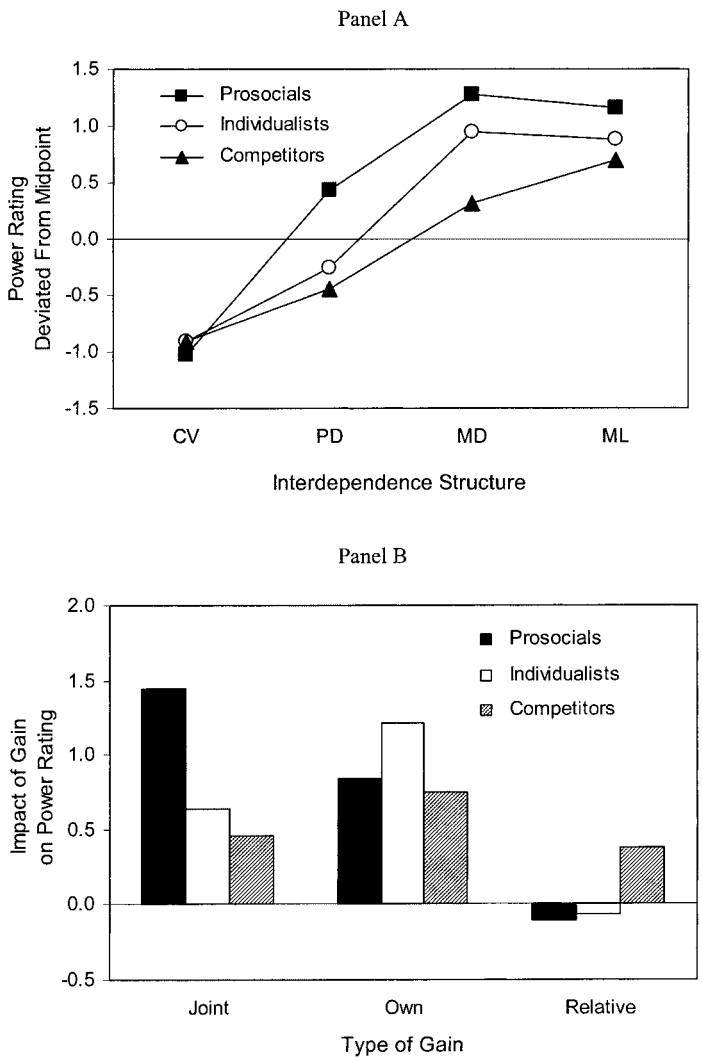

Figure 3. Power ratings as a function of interdependence structure and social value orientation (Panel A), and impact of joint, own, and relative gain on power ratings within each social value orientation (Panel B)

Relative Impact of Joint, Own, and Relative Gain within Social Value Orientation

As before, we were also interested in evaluating the *relative impact* of each type of gain within each social value orientation. Simple tests of the effect of type of gain within each social value orientation produced results partly consistent with the Goal Prescribes Power Hypothesis. *Within prosocials*, the impact of joint gain (on power ratings) was significantly larger than the impact of both own gain, $F(1, 143) = 4.78$, $p < 0.05$, and relative gain, $F(1, 143) = 29.04$, $p < 0.001$; within prosocials, own gain also produced a greater increase in power ratings when compared to relative gain, $F(1, 143) = 11.72$, $p < 0.001$. *Within individualists*, the impact of own gain was significantly higher than both the impact of joint gain, $F(1, 143) = 6.71$, $p < 0.05$, and relative gain, $F(1, 143) = 36.71$, $p < 0.001$; within individualists, joint gain also resulted in a significantly larger increase in power ratings than did

relative gain, $F(1, 143) = 9.89$, $p < 0.01$. *Within competitors*, none of the comparisons were significant (all p's > 0.20).

Absolute Impact of Joint, Own, and Relative Gain within Social Value Orientation

Next, we examined the *absolute impact* of each type of gain on power ratings for each social value orientation. Results revealed that prosocials viewed both joint gain and own gain as powerful, F's$(1, 143) = 56.55$ and 25.13, p's < 0.001, but did not view relative gain as powerful, $F(1, 143) < 1$, *ns*. Individualists also viewed both joint gain and own gain as powerful, F's$(1, 143) = 18.06$ and 88.59, p's < 0.001, but did not view relative gain as powerful; $F(1, 143) < 1$, *ns*. Competitors viewed each type of gain to be powerful; respective F's, joint gain, $F(1, 143) = 5.52$, $p < 0.05$, own gain, $F(1, 143) = 19.51$, $p < 0.001$, and relative gain, $F(1, 143) = 3.95$, $p < 0.05$.

Summary

To summarize, the results for power are generally in line with a Goal Prescribes Power principle for prosocial and individualistic groups. For competitors however, the Goal Prescribes Power principle received less support.

Might Over Morality Hypothesis

Next we report the results of analyses relevant to Might Over Morality Hypothesis. As stated in the introduction, our purpose was to examine the generality of the effect and hopefully increase our understanding of its meaning, by examining the differences between the morality and power judgments of prosocials, individualists, and competitors within each of the four game structures. For each component of the effect (morality, then power) a one-way multivariate ANOVA was conducted. In each MANOVA the multivariate dependent variable was the four ratings (morality or power) in each of the game structures. The single independent variable was social value orientation. Global multivariate tests were followed up by two planned contrasts; the first compared prosocials with individualists and competitors combined, while the second compared individualists with competitors. For all multivariate tests, p-values are based on Rao's transformation of Wilk's Lambda. Significant multivariate effects were examined in terms of univarate tests within each of the four structures.

Morality Ratings

The global multivariate effect for social value orientation was significant, $F(8, 282) = 2.35$, $p = 0.02$. The first social value orientation contrast (prosocials versus individualists and competitors combined) was significant at the multivariate level, $F(4, 140) = 3.55$, $p = 0.01$, whereas the second contrast (individualists versus competitors) was not, $F(4, 140) = 1.79$, $p = 0.13$. Univariate tests on the first contrast (prosocial versus individualists and competitors combined) within each structure yielded the following results. In *convergence*, prosocials saw a significantly larger morality difference between the two choice alternatives ($M = -0.83$) than the other two groups combined ($M = -0.42$), $F(1, 143) = 5.50$, $p = 0.02$. Note that the negative sign for each mean indicates that in both cases the *top* row (the altruistic choice maximizing only the other's gain) was judged as *less* moral than the bottom

row (the choice that maximizes joint, own, and relative gain). This suggests that in this structure, the morality facet of Might Over Morality is tied less to distinctions between altruism and non-altruism and more to distinctions between cooperative and non-cooperative acts. Results for the remaining three games are consistent with this idea. In *prisoner's dilemma*, the morality discrimination was marginally higher in prosocials ($M = 0.32$) than in the individualists and competitors combined ($M = -0.01$), $F(1, 143) = 3.28$, $p = 0.07$. These findings are in line with those typically found in Might Over Morality research, which has used the prisoner's dilemma structure. In *maximizing difference*, prosocials also showed a larger discrimination in the morality of the two alternatives ($M = 1.04$) than individualists and competitors combined ($M = 0.53$), $F(1, 143) = 9.40$, $p = 0.01$. Finally, in *malice* prosocials once again showed a larger discrimination in the morality of the two alternatives ($M = 1.07$) than individualists and competitors combined ($M = 0.47$), $F(1, 143) = 10.94$, $p = 0.001$. In sum, these results demonstrate the generality of the morality component of Might Over Morality Hypothesis. These results further suggest the morality component of the Might Over Morality effect involves distinctions between acts that maximize collective welfare versus those that do not.

Power Ratings

The global multivariate effect for social value orientation was significant, $F(8, 240) = 4.07$, $p < 0.001$. The multivariate effect was also significant for both the prosocial versus individualist and competitor combined contrast, $F(4, 140) = 5.49$, $p < 0.001$, as well as for the individualists versus competitors contrast, $F(4, 140) = 3.32$, $p < 0.01$. At the univariate level, the global social value orientation effect was reliable in only two games, namely prisoner's dilemma, $F(2, 143) = 8.30$, $p < 0.001$, and maximizing difference, $F(2, 143) = 10.85$, $p < 0.001$; the p-values for convergence and malice were 0.70 and 0.14, respectively. Within the *prisoner's dilemma*, prosocials showed a larger distinction in the power of the two alternatives ($M = 0.43$) than individualists and competitors combined ($M = -0.35$), $F(1, 143) = 16.53$, $p < 0.001$. Thus, prosocials judge the cooperative choice as most powerful (their mean is positive) and individualists/competitors judge the non-cooperative choice as most powerful. Individualists and competitors did not differ significantly in the prisoner's dilemma ($p > 0.39$). Within *maximizing difference*, prosocials rated the top row as significantly more powerful ($M = 1.47$) relative to proselfs ($M = 0.63$), $F(1, 143) = 10.06$, $p < 0.001$, and individualists rated the top row as significantly more powerful ($M = 0.95$) compared to competitors ($M = 0.31$), $F(1, 143) = 11.57$, $p < 0.001$. In contrast to our results for morality, the results for power ratings provide little if any support for the power component of the Might Over Morality effect: cooperators use power in distinguishing between cooperative and non-cooperative alternatives in the prisoner's dilemma and maximizing difference (viewing cooperation as more powerful in both cases), and individualists and competitors view the cooperative alternative in a maximizing difference game as more powerful than the non-cooperative alternative, which is opposite to what the Might Over Morality Hypothesis would predict.

DISCUSSION

The present study examined how individuals with different social value orientations (i.e., prosocial, individualistic, and competitive orientations) construe choices in four distinct interdependence structures in terms of morality, rationality, and power. As predicted, the judged rationality of joint, own, and relative gain was meaningfully linked with an individual's social value orientation, with the pattern of results lending support to the Goal Prescribes Rationality Principle (Van Lange et al., 1990).

Ratings of the morality and power of joint gain, own gain, and relative gain, were also linked with an individual's social value orientation, in partial support and the so-called Goal Prescribes Morality (or Power) Hypothesis. In what follows, we discuss the these patterns in more detail. Following this we discuss our findings relevant to the Might Over Morality Hypothesis and conclude with suggestions for future research.

Does the Goal Prescribe Rationality, Morality, and Power?

Research over the past 30 years has convincingly demonstrated that a notable proportion of individuals cooperate in the prisoner's dilemma (e.g. Kelley & Stahelski, 1970; Kuhlman & Marshello, 1975; McClintock & Liebrand, 1988). This finding poses a problem for game theoretic models which assume that the only rational choice in the prisoner's dilemma is defection, at least in the context of a single-trial prisoner's dilemma (e.g. Luce & Raffia, 1957). One response to this discrepancy has been to assume that individuals differ in their perceptions of rationality, with some perceiving joint gain as rational, and others perceiving individual or relative gain as rational. To date, evidence for the Goal Prescribes Rationality Principle (Van Lange et al., 1990) has been mainly indirect, being implied on the basis of individuals' choices, their response to another's personality characteristics (e.g. Van Lange & Kuhlman, 1994; Van Lange & Liebrand, 1991a), or their evaluations of another's behavior (Van Lange et al., 1990). The present study took a different approach to the problem by asking individuals directly to provide ratings as to the most rational course of action in interdependent settings across a series of interdependence structures (including the classic prisoner's dilemma) which clearly distinguished between the three most common social value orientations: prosocial, individualistic, and competitive. While we did not directly examine choice behavior, our results are consistent with, and would thus seem to shed light upon, the large body of literature on social value orientation which continues to demonstrate meaningful links between these relatively stable individual differences and decision making in settings of social interdependence. In general, the largest increases in rationality ratings occurred when an individual's social goal was added to the top row, in line with the Goal Prescribes Rationality Principle (Hypothesis 1b). However, if we simply focus on the absolute ratings, two findings were not consistent with the Goal Prescribes Rationality Principle. First, prosocials and competitors, in addition to individualists, viewed own gain as rational. Second, individualists viewed joint gain as rational. These results, while not in line with a 'strong' interpretation of the Goal Prescribes Rationality Principle, do indicate that rationality ratings are meaningfully linked to one's own social value orientation and its proximity to other social value orientations within the geometric social value orientation space. In other words, social value orientation does appear to influence the *relative* rationality of various types of gain based on their proximity to the individual's own social value orientation.

Beyond mere proximity within a theoretical geometric space, the current results for rationality may have some basis in actual social interaction. For example, prosocials, while inclined to cooperate with a cooperative partner, choose non-cooperation in the face of a non-cooperative partner, and individualists, while inclined to act in their own self-interest, choose to cooperate when paired with a partner pursuing tit-for-tat (e.g. Kuhlman & Marshello, 1975). Assuming these results are representative of social interactions of prosocials and individualists in the real-world, such contingent interaction patterns (i.e. strategies) may give rise to the pattern of rationality ratings in the present study. Prosocials have learned that in some circumstances that pursuing own gain is rational, and individualists have learned that pursuing joint gain is also sometimes rational. But what about competitors? While early studies suggested that competitors do not learn to cooperate, even against a tit-for-tat partner, at least one recent study has shown that competitors do learn to cooperate more (with

a different partner) after interacting with a tit-for-tat partner, apparently in part because they gain a greater respect for the others' willingness to pursue/defend their own interests (Sheldon, 1999). Our findings for competitors appear to be in line with these recent findings, in that our competitors viewed own gain as rational.

Beyond rationality, the present results also demonstrate that individual differences in social value orientation are partly linked with the definitions or construal of the morality and power of social choice. The general pattern of results (see Figures 2 and 3) suggest that, just as the goal prescribes rationality, the goal may also prescribe morality and power, but the results tend to be the strongest for prosocials and individualists. Indeed, the relationship between social value orientation and such ratings would appear to be ordered in a manner similar to Kuhlman and Wimberley's (1976) *Structured Assumed Similarity Bias*. Kuhlman and Wimberley found that people tend to assume that most others will pursue social value orientations consistent with their own. When estimating the proportion of people who would pursue orientations different than their own, people's expectations correspond to the relative proximity of those orientations within the two-dimensional social value orientation space (i.e. prosocials think most people would pursue a prosocial orientation, relatively fewer would pursue individualism, and even fewer would pursue competition, whereas competitors think just the opposite). The present results suggest that a similar principle may be operating when individuals evaluate the rationality, morality, and power of various social choice options. Specifically, they indicate that prosocials and individualists first assume that their own social goal is the most moral and most powerful, and subsequently judge the morality and power of social goals other than their own on the basis of the goal's proximity to their own orientation (the closer, the better). Competitors, however, appear to judge morality and power more as individualists: competitors judge own gain as more moral than joint or relative gain, and they judge own gain (descriptively) as the most powerful, though statistically they view each type of gain as equally powerful.

Revisiting the Might over Morality Hypothesis

In addition to providing support for the Goal Prescribes Rationality (Morality, and Power) Principles, the present results provide some support for the Might over Morality Hypothesis (Liebrand et al., 1986a), the idea that prosocials interpret the 'cooperative-competitive' dimension in terms of morality, whereas individualists (and competitors) interpret that same dimension in terms of power. In the present study, we assumed that such differences would influence the relative weight individuals assigned to morality and power when distinguishing between social choice alternatives with prosocials distinguishing between those alternatives more in terms of morality, and individualists and competitors distinguishing between the alternatives more in terms of power.

With regard to *morality*, prosocials tended to show a larger morality distinction than proselfs between the choice alternatives in all four games. Beyond showing the generality of this component of the effect, our results strongly suggest that the type of social action seen as most moral by prosocials is the maximization of collective welfare rather than self-disinterested altruism. Research on the assessment of social value orientation over the past four decades has consistently shown that altruism is rare, whereas joint-gain is quite common. The present results suggest that the type of prosocial behavior that actually occurs in real people (joint gain) is a basis for their working definition/construal of morality.

With regard to *power*, our results provide no support for the Might Over Morality hypothesis. Prosocials differed from proselfs in only one game (prisoner's dilemma); furthermore, prosocials' power ratings were more (not less) extreme than proselfs. Perhaps this indicates a weakness in this component of the Might Over Morality Hypothesis. It may also be that the word 'power' has a highly idiosyncratic meaning across individual subjects, which would make it quite unreliable as a measure,

of anything. We think this unlikely, given the nature of our results reported for the Goal Prescribes Power Hypothesis. Finally, it may be that the word 'power' is simply not a very good prototype of the construct that this part of the Might Over Morality hypothesis is about. While our results both underscore and clarify one component (morality) of Might Over Morality, they do neither for the other. Further study of the power component would seem an important task for future research.

Limitations and Avenues for Future Research

Before closing, we wish to comment on some of the limitations of the present study and suggest several possible avenues for future study. One potential limitation of the present study is that we did not directly assess choice behavior. However, it seems reasonable, given the correspondence between past research and the pattern of ratings demonstrated here, that the present differences in construal may hold important implications for social interaction in a variety of settings. It is conceivable, for example, that the differing construals demonstrated here might lead people with different social value orientations to experience a heightened level of conflict in interdependent settings. For example, in group discussions, it is possible that when prosocials, individualists, and competitors talk about intelligent (rational), moral, and powerful actions, they are referring to different things (e.g. Beggan et al., 1988). Such differences may then make it difficult for groups of individuals with different social value orientations to reach consensus. A second potential limitation of the present study concerns the temporal proximity between the decomposed games measure of social value orientation and the subsequent matrix ratings. It could be argued, for example, that the close timing between the two measures may have influenced participants to give similar responses in the two tasks. In light of this possibility, it is relevant to note that past studies have demonstrated links between social value orientation and subsequent (choice, expectation, and person perception) responses with much longer (4–6 week) delays between the two tasks (e.g. Kuhlman, Camac, & Cunha, 1986; Kuhlman et al., 1992; McClintock & Allison, 1989). Based on these findings, we believe the present results would hold with longer delays between the two tasks, but future research might benefit by testing this claim more directly. Another potential limitation of the present study concerns the potential methodological overlap between the assessment of social value orientation and our primary outcome measures. Given that social value orientation was assessed using decomposed games, and ratings of morality, rationality, and power were assessed within the context of experimental games—which, ultimately, are recompositions of decomposed games—future research using alternative (non-mathematical) measures of social value orientation and/or perceptions of morality, rationality, and power might also be helpful in evaluating the generalizability of the present findings. Finally, it is important to recognize that we did not provide our participants with explicit definitions of morality, rationality, and power. This raises the possibility that individuals with different social value orientations attach quite different meanings to these terms, beyond their association with joint, own, and relative gain. As just one example, individuals may differ in the extent to which they view morality as reflecting adherence to societal expectations and their corresponding rewards/punishments vs. adherence to higher principles, like maximizing joint gain (cf. Kohlberg, 1976). Future research aimed at better understanding these varying interpretations could shed additional light on the differences reported in the present study.

Concluding Thoughts

Behavior in interdependent situations stands at the basis of understanding harmonious versus acrimonious interactions, and construal of actions in such situations is often assumed to underlie

such behavior and interactions. The present research examined such construal processes in four theoretically-defined interdependence structures which allowed us to separate various motivational orientations which are confounded in the most-studied interdependence structure: the prisoner's dilemma. On the basis of the present findings, we suggest that in evaluating interdependent behavioral options, the 'self' is (consciously or unconsciously) very strongly involved, in that the self's motivational orientation appears to be a very strong determinant of construal processes. The orientations people hold are construed as most rational, most moral, and most powerful, followed by neighboring orientations, whereas the orientations that are most distal from one's own orientation are considered to be the 'worst'. Depending on the composition of the dyad (or the group), such construal processes may help individuals to resolve several important interpersonal dilemmas, or may evoke misunderstanding whereby individuals with different orientations may blame others of behaving irrationally (or immorally and 'softly'). Future research aimed at understanding the implications of these conflicting construals could shed much light on the generation and resolution of conflict in interdependent settings.

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